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<p>(54) Title: WIND OPERATED SLIDING SAIL TOY</p> <div data-bbox="422 1071 1218 1638"> </div> <p>(57) Abstract</p> <p>A flying toy (10) having a body member (28), at least one guideline (12, 14) having a first end (16, 18) and a second end (20, 22) and a handle member (26) respectively secured at each end. The body member, which operates aerodynamically, may include a frame (30) and sail (32), or alternatively, the frame and sail may be replaced by a one-piece or composite sail frameless structure. The flying toy may be provided with support elements (40) which are slidably secured to the body member and to the fasteners (34) for supporting the body in a desired orientation between first and second guidelines (12, 14). Alternatively, the support elements may be included as a part of the frame of the body member.</p>		

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**WIND OPERATED SLIDING SAIL TOY****RELATED APPLICATION**

This application claims the benefit of priority from U.S.  
5 Patent Application 08/625,338, filed April 1, 1996.

**FIELD OF INVENTION**

The present invention is directed to flying toys, and more particularly is directed to a wind driven flying toy having one  
10 or more guidelines and which is capable of reversing direction of flight along the one or more guidelines through manipulation of a handle by the user.

**BACKGROUND OF THE INVENTION**

15 The prior art is replete with numerous toys and flying apparatus which have been developed for fun and entertainment, educational purposes and competition. Flying toys attached to strings, including for example, kites, have been used and enjoyed for centuries. More recently, a number of aerodynamic toys  
20 designed to be thrown in the air for use in throwing games have become very popular. For example, U.S. Patent 3,359,678 shows a flying saucer; U.S. Patent 3,976,295 shows a tethered disc enabling retrieval if the disc does not make it back to the operator in the course of its flight; U.S. Patent 4,516,946 shows  
25 a flying disc construction having an annular roller bearing at its center; and U.S. Patent 4,802,875 shows a tethered flying disc with a two-piece bearing for control of the disc on a support line.

A number of kite string toys and flying devices have been  
30 described in prior art, representative examples of which include U.S. Patents 1,172,198, 2,041,233 and 3,752,424. All of these devices require manual reset before the device can re-climb the

kite string before the dive down action. U.S. Patent 4,805,853 provides a modification of this type of device by having means to adjust elevator tabs at the rear wing tips of the device and includes a parachute launching mechanism.

5 Another genre of prior art flying toy using guidelines is disclosed in U.S. Patent 518,931 where a toy is shown in which the inclination of the guidelines can be reversed. Similarly, U.S. Patent 2,388,513 shows the use of a line connected to a toy  
10 air plane to affect the release of toy bombs. U.S. Patent 3,838,855 discloses a toy air plane carried by a support line connected to a fixed reel. U.S. Patent 4,522,605 shows a toy operable over an inclined guideline extending between two fixed supports and runs over a fixed support eye to a freely held reel with hand extensions.

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#### SUMMARY OF THE INVENTION

In accordance with the present invention, an exciting, high-speed and smooth-working flying toy is provided capable of being wind driven in both directions on one or more guidelines. The  
20 toy of the present invention may be controlled by one or more users in a variety of ways not previously available with prior art devices. The direction of flight of the toy may be reversed simply by rotation of the handles 180 degrees, while other methods are provided to alter the pitch of the sail. For  
25 example, pitch adjustment may be accomplished by varying the distance between the guidelines. These and other methods of flight adjustment will be discussed in greater detail hereinafter.

To accomplish these and other objects and advantages of the  
30 present invention, the present invention provides a flying toy comprising, in one embodiment a first and a second guideline. Each guideline has two ends and each end includes a handle

secured thereto. The handle may, at each end of the guideline, connect both guidelines, or a separate handle may be provided for each end of each guideline. A body member for operating aerodynamically includes a frame and a sail element. Fasteners  
5 are secured to the frame and to the guidelines, or may be integral with the frame. In one embodiment, support elements are secured to the body member and to the fasteners for supporting the body member in a desired orientation between the first and the second guidelines. Alternatively, the frame may be  
10 configured to provide the support of the body member in a desired orientation between the first and second guidelines.

Alternative embodiments employing one-piece or frameless structures, single line embodiments as well as alternate handle designs will be discussed in greater detail hereinafter.

15 Accordingly, it is a principal object of the present invention to provide a flying toy which is wind driven in both directions, runs on one or more guidelines, and reverses directions by rotating the handles 180 degrees transversely.

It is another object of the present invention to provide a  
20 flying toy in which control of the sail pitch adjustment is allowed by varying the width of the guidelines in relation to one another, thereby controlling the pitch of the sail, or by repositioning the sail element within an independent rigid frame.

It is a further object of the present invention to provide  
25 a flying toy which may be flown using either a horizontal, vertical or other angular orientation of the guidelines and may be used by one or two participants.

It is an additional object of the present invention to provide a flying toy which may be of a one-piece or composite  
30 frameless design.

It is still another object of the present invention to provide a flying toy which may be operated on a single guideline.

It is an additional object of the present invention to provide a flying toy which is easily manufactured and assembled.

It is another object of the present invention to provide a flying toy having safe handle structure which will prevent injury to the user of the flying toy during moderate or high speed operation.

Further objects and advantages of the invention will become apparent from a consideration of the ensuing description and the accompanying drawings.

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#### BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 shows a front perspective view of the flying toy of the present invention.

Figure 2 shows a perspective view of the flying toy of the present invention illustrating the operation of support element 40 and fasteners 34.

Figure 3 shows a front perspective view of the flying toy of the present invention with a spherical frame and octagonal sail, according to an alternative embodiment of the invention.

Figure 4 shows an end view of the embodiment illustrated in Figure 3 but not connected to guidelines.

Figure 5 shows a sectional view through line 5-5 of Figure 2 of a stabilizing pin 52 in vertical frame member 30, according to the present invention.

Figure 6 shows a sectional view through line 6-6 of Figure 2 of a sliding sleeve 54 on vertical frame member 30 as an alternative embodiment to stabilizing pin 52 shown in Figure 5.

Figure 7 shows a side view of a frameless two-piece flying toy.

Figure 8 shows a front view of the hollow center frameless two-piece toy of Figure 9.

Figure 9 shows a top view of a hollow center frameless two-piece flying toy.

Figures 10a, 10b, 10c and 10d each detail alternative handle structures.

5 Figure 11 illustrates a single guideline embodiment of the present invention.

Figure 12 illustrates a frameless single guideline embodiment of the present invention.

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#### DETAILED DESCRIPTION

Figures 1 and 2 show a flying toy 10 according to one embodiment of the present invention. The flying toy 10 comprises a first guideline 12 having a first end 16 and a second end 20, and a second guideline 14 having a first end 18 and a second end 15 22. The first and second guidelines preferably are composed of a monofilament fishing line. However, other suitable materials may be used for the guideline, including for example, cord, wire, string or the like.

The pair of guidelines 12 and 14 may be of various lengths and materials. In addition, a reel mechanism (not shown) may be 20 incorporated for selection of line lengths used during play and for winding during non-use (i.e., storage).

In the embodiment shown in Figures 1 and 2, a handle 26 is secured to first ends 16 and 18 of the first and second guideline such that one hand of a user controls the first end of both 25 guidelines with a single handle. Similarly, a second handle 26 is secured to second ends 20 and 22 of the first and second guideline such that one hand of a user controls the second end of both guidelines with a single handle. Alternatively, a handle 30 may be attached to each end of each guideline such that four handles are provided. In another alternative embodiment, handles

may be eliminated altogether and the user(s) simply grasps or wraps ends 16, 18, 20 and 22 in his/their hands. A compressible bumper member 44 composed of a compressible material, including for example, rubber, urethane or plastic, preferably is secured to the guidelines near ends 16, 18, 20 and 22 to prevent discomfort or injury to the user when flying toy 10 approaches handle 26. Bumper member 44 may be spherically configured as shown in Figure 1 and secured to the guidelines by a knot 48 or may be secured by mechanical fasteners such as snaps, clamps, pins or the like. Alternatively, different shaped bumper members may be used, including for example, tube configured bumper members 44 shown in Figure 3 or any other shape adapted to the guidelines. The guidelines may be connected directly to the handles as shown in Figure 3 or may be attached to the handles by means of a connecting means, for example straps 46. As shown in Figure 1, straps 46 preferably are secured to handles 26 by snaps 50, clamps, pins or other mechanical fasteners, or may be tied by a knot to handle 26.

Referring to Figure 2, a body member 28 preferably comprises a frame 30 and a sail element 32 secured to said frame. The frame preferably is composed of rigid carbon graphite tubes. However, it is to be understood that any lightweight, rigid and durable material, including for example, fiberglass rods, wood dowels, aluminum or metal alloy tubes, plastic tubes, rods or the like, or alternatively one piece molded designs, may be used. Sail 32 preferably is composed of a ripstop nylon cloth, however, any durable resilient material may be substituted for such material, including for example, TYVEK, mylar, foil, paper, plastic, cloth, rubber, foam sheeting or the like, and may include battens therein.



The frame 30 may include a stabilizing means to maintain the center of gravity at the bottom of the frame. Referring to Figure 5, a stabilizing pin 52 may be placed in each vertical member of frame 30. Pin 52 may be substituted by granular metal, sand, liquid, and the like, inside the vertical frame member to achieve the same results. Pin 52 (or the alternative elements, if used) slides to the bottom of the vertical frame member whenever the sail is rotated 180 degrees, thus keeping the center of gravity at the bottom of frame 30 and thereby eliminating any tendency of frame 30 to tip from being slightly top heavy. Figure 6 shows an alternative stabilizing implementation to that shown in Figure 5 which may be incorporated into flying toy 10. In Figure 6, a sliding sleeve 54 is shown in a sectional view; preferably, four sliding sleeves are provided on the frame, one sleeve for each end of frame 30 vertical members. The sliding sleeve may be composed of metal, composite, plastic or other durable, resilient materials, and are slidably secured to frame 30. Sliding sleeve 54 performs the same function as pin 52 shown in Figure 5, namely keeping the center of gravity at the bottom of flying toy 10 even after rotation of sail 32, and is shown as an alternative to pin 52. Of course, other alternatives to pin 52 or sliding sleeve 54 are contemplated and use of such stabilization weights are optional on flying toy 10.

The sail 32 may be secured to frame 30 by a frame/sail connector 42 such as a cord or by O-rings, shock cords, wire, string, rubber bands, adhesive, or any other conventional fastening device, or fastened directly thereto.

The flying toy shown in Figures 1 and 2 has an elongated frame and sail configuration, while the embodiment shown in Figures 3 and 4 has an octagonal configuration. Any shape or configuration of the frame and sail may be used for body member

28, for example, triangular, pentagonal, circular, etc. Body member 28 preferably is pivotally attached to guidelines 12 and 14 by fastening elements 34 shown in Figures 1 and 2 as elongated tubular members 34, hereinafter referred to as guidetubes 34, through which guidelines 12 and 14 pass. However, body member 28 may be secured to guidelines 12 and 14 by other means, including for example, a plurality of split ring fasteners, roller bearings or any other mechanical fastener capable of slidably securing body 28 to guidelines 12 and 14.

Support elements 40 are shown in Figures 1 and 2 and are slidably connected to guidetube 34. Support elements 40 may be slid down frame 30 or detached when toy 10 is to be packed, stored or transported, such that toy 10 folds up into a flat, easily carried or stored configuration. To reopen, support elements 40 are slid upward or reattached to frame 30 and toy 10 is ready again for use. Support element 40 may be built as a part of frame 30 or as an independent element. In use, support elements 40 may be adjusted to control the angle of sail 32 within guidelines 12 and 14 by sliding the supports either up or down frame 30. Alternatively, other embodiments such as those shown in Figures 3 and 4, will not include support elements 40. Rather, frame 30 may be constructed such that it articulates at articulation connector 43 according to the spacing between guidelines 12 and 14, thereby allowing sail pitch adjustability.

Referring now specifically to Figures 3 and 4, an alternative embodiment of flying toy 10 is illustrated. The embodiment in Figures 3 and 4 has a sail 32 with an octagonal configuration. In this embodiment, it is preferable to use eyelets 36 to secure frame 30 to guidelines 12 and 14, however, as with the embodiment shown in Figures 1 and 2, alternative

fasteners such as split ring fasteners, roller bearings, or the like may be utilized. The configuration of sail 32, although shown as octagonal in Figures 3 and 4 may be of any shape, for example, spherical, triangular, pentagonal or novelty shapes, such as animals, fish, cartoon characters, artistic designs and the like.

For embodiments of flying toy 10 such as illustrated in Figures 3 and 4 which utilize a spherical frame configuration, frame 30 preferably is constructed out of a flexible, durable material such as fiberglass flexible rods, tubular material, or plastic. For ease of assembly and disassembly shock cord linkers/connectors may be used within the frame members as well as with the embodiment illustrated in Figures 1 and 2. As with the embodiment illustrated in Figures 1 and 2, the embodiment shown in Figures 3 and 4 is capable of use with a horizontal or vertical line orientation. The flying toy 10 travel direction may be reversed on the guidelines by simply rotating handles 26 by 180 degrees. It may be used by one or two participants, and sail pitch adjustments can be made by varying the relative width of guidelines 12 and 14 to one another, as well as manipulating the articulation connector 43.

In operation and use flying toy 10 may be used by either one or two users. Flying toy 10 is very simple to assemble, use, disassemble and store. The user, to assemble the embodiments shown in Figures 1 and 2, simply slides support elements 40 to an open position, extends guidelines 12 and 14 and then each participant takes hold of a handle. To control frame 30 and sail 32 on guidelines 12 and 14, the user simply rotates handle 26 180 degrees transversely to the guidelines thereby reversing sail angle and flying toy 10 reverses direction. In this manner, when flying toy 10 reaches one end of the guidelines, the user at that

end rotates handles 26 and the toy glides along guidelines 12 and 14 to the other user's end. If each end of guidelines 12 and 14 are supplied with two handles instead of one, the users also may control the sail pitch by varying the width or height of guidelines 12 and 14 in relation to one another.

If support elements 40 are used, such as illustrated in Figures 1 and 2, the angle and orientation of sail 32 may be adjusted by sliding the supports up or down frame member 30. Flying toy 10 may be used for play, competition, racing, education activities, stunts and the like. Because of the unique control of the sail and frame possible with the present apparatus, numerous activities are possible beyond simply flying the toy, such as picking up objects, sending messages between users or configuring sail 32 as a plane and sending cargo or dropping play bombs or the like.

Frame 30 may be eliminated if more than two guidelines are used or if a sufficiently rigid sail material is utilized. In an alternative embodiment, the frame may be eliminated by utilization of a composite structure comprising a rigid sail and support structure slidably connected to one or more guidelines. Alternatively, the structure may be unitary with a one-piece molded, formed, or otherwise fabricated structure replacing the composite sail and support structures. Figures 7, 8 and 9 collectively, and 12 illustrate frameless embodiments of the present invention.

Figure 7, illustrates a solid one-piece sail 70 which has been inserted within support structure 72 through slot 71. The sail is placed at an angle across the structure 72. The specific angle can be chosen to alter the dynamics of flight. Guidetubes 74 are secured along the longitudinal axis of the support structure by securing means 73. Guidelines 12 and 14 are fed

through the guidetubes and operate in a like manner to guidelines 12 and 14 of the above disclosed embodiments. The solid one-piece sail structure and the support structure may be composed of any suitable material conventionally known in the art, including for example, cardboard, fiberboard, styrofoam, high density foams, molded plastics, vacuum formed plastics, foam board, balsa wood, corrugated plastics, molded foams or other equivalent materials. Furthermore, any resilient materials, such as mylar or vinyl, that can be inflated under pressure to form a rigid sail or support structure may be used. In addition, the solid one-piece sail structure and the support structure may be integrally fabricated, formed or molded into a unitary flying toy structure (not shown).

The guidetubes, eyelets or other fasteners for slidably connecting the flying toy to the guidelines may be secured to the support structure and/or sail structure by any of numerous common securing means, including but not limited to, brackets, glue, snaps, fitted openings and the like. Alternatively, the slidable connection may be integrally formed, molded, or fabricated into the support structure and/or sail structure; or the slidable connection may be integrally formed, molded, or fabricated into the unitary structure.

The one-piece sail structure and the support structure may be fabricated from one or more sheets of material typically used in the manufacture of cartons. The use of such materials, for example cardboard, would enable construction of the present invention from a pre-manufactured carton, for example a cereal box. In this manner, the flying toy's sail structure and support structure could be in the form of a simple cutout. It is contemplated that further assembly of the flying toy could include commercially available tubular structures, such as drinking straws, for use as guidetubes 74.

Figures 8 and 9 illustrate a one-piece, rigid sail, frameless embodiment wherein the support structure 82 has a hollow center section to reduce weight. This embodiment has a solid sail 80, cut-out support structure 82, guidetubes 84 (integral with support 82 or secured thereto) and is operated with guidelines 12 and 14. The support structure 82 can be a two-piece body that snaps together around the sail 80, a one-piece body with slots to receive the sail therethrough or can be integrally formed or molded.

Figures 10a, 10b, 10c and 10d each show various embodiments directed to alternative handle structures. Figure 10a illustrates a rigid or semi-flexible handle 101 with eyelets 101a and 101b for securing the guideline to the handle. As shown in Figure 10a, guideline 14 is fed through a rigid deflection section 103, absorption spacers 102, eyelet 101b, back through the spacers and deflection section and secured by knots 105 or other equivalent methods of retaining the guidelines therein. Guideline 12 is secured to the handle in a similar manner. The use of the absorption spacers and deflection section provides both impact absorption and finger protection. Numerous other methods are possible for securing absorption spacers between handle 101 and deflection section 103, including for example, glue, slidable connection of deflection section to handle, strap, etc. A variable number of spacers or absorption spacers of variable thicknesses can be used to achieve adequate protection of both the flying toy and user's hand(s) depending upon the speed and/or weight of flying toy.

The handle and deflection section can be constructed from a variety of materials, including for example, PVC, ABS plastic, polystyrene, nylon, wood, metal alloy, rubber or equivalent materials, with a comfort grip made of foam, leather, cork,

5 fabric tape, vinyl rubber or equivalent materials. The absorption spacers can be constructed of high density compressible foam. In operation, if the flying toy comes in contact with deflection section 103, the deflection section will be elastically absorbent of the forces imparted thereon.

10 Figure 10b illustrates a semi-rigid handle structure 106 having guideline channels 107. The handle can be made of various shapes and material such as a molded, die-cut or fabricated high density foam handle. Whereas handle 101 has a plurality of parts to provide for finger protection and shock absorption, handle 10b provides for all of these desirable features by integrating these functions into a substantially single monolithic structure. The high density foam has sufficient rigidity to serve as a durable handle means, and at the same time is sufficiently compressible to absorb energy upon impact to prevent damage to the flying toy and to increase longevity by reducing cyclic shock fatigue. The high density foam completely encloses the finger area thereby providing for positive finger protection. The guidelines may be attached directly to the handles by a variety of attachment means including threading the guideline through the channel 107 provided in the handle (and through optional bushing 202). The guideline then is knotted or attached to a stopper object 104, such that it cannot pass back through the channel 107. The use of bushing 202 is optional and may be eliminated if the stopper means is sufficiently large to prevent the line from pulling back through the somewhat stretchable hole in the foam handle. The bushing may be made from plastic, wood, metal alloy or other rigid light weight material.

30 Another alternative means for securing the guideline to a handle is shown in Figure 10c. In this method of guideline attachment, each guideline passes through a channel 107, bushing

202 and a taper clamping pin 204. When the guideline is the correct length and in proper alignment, the taper pin is inserted into bushing 202 which causes the taper pin to clamp onto the guideline, thereby securing the guideline to the handle. This method provides for easy adjustment of the guideline by simply removing the taper clamping pin from the bushing, allowing the guideline to advance to a new position and reclamping the pin at the new position. It is to be understood that this alternative securing method can be incorporated into any of the disclosed handles or equivalents thereof.

Another variation of the above design is an inflatable handle (not shown), or permanently inflated handle that is inflated to the appropriate pressure to provide sufficient rigidity for a handle function while at the same time maintaining a degree of compressibility to provide the energy absorbing function.

Figure 10d illustrates a handle 108 supporting an elastic structure 109. The guidelines 12 and 14 are secured to eyelets 112a and 112b. The handle has a finger receiving section 111 to increase gripping and comfort and protection sections 113 and which both protect the fingers from contact with the flying toy structure and prevent forward movement of the hand from the gripping section 111. The elastic structure can be made of a heavy rubber band or other equivalent elastic structures and the handle can be injection molded, die-cut or pre-fabricated from plastic, wood, metal alloy or equivalents thereof. In operation, the flying toy structure would be elastically reflected by elastic member 109, thereby preventing contact with the user's hand, damage to the flying toy and enhanced play action.

Figure 11 illustrates a single guideline embodiment of the present invention. The use of a single guideline provides a



reduction in materials, eliminates twisting of multiple guidelines and unwanted twisting and flipping. The flying toy comprises a frame 30 and sail structure 32 similar to that shown in Figure 2. The guidetubes 34 have been replaced by a single  
5 guidetube 120 extending across the width of the sail and through an opening in the sail. Two extensions 122 are integrated with the guidetube such that the sail structure is placed at an angle (i.e. pitch) with respect to the guidetube. The extensions 122 can be integrally molded with the guidetube or can be attached  
10 by various methods and can be of various shapes and sizes according to desired flight characteristics. The flying toy shown in Figure 11 also comprises a handle 112 having handle sections 114 and a foam section 116. Handle sections 114 are designed to engage the frame 30 and foam section 116 absorbs the  
15 flying toy's impact. In this embodiment, only the single guideline 12 is necessary for directing the flight path of the frame and sail structure.

In operation, the flying toy traverses the length of the guideline until coming in contact with the handle of a user.  
20 Upon contact, a user can manually change the pitch of the sail by flipping the flying toy 180 degrees either by hand or by interaction with the handle. As in the embodiment shown in Figures 1 and 2, the flying toy illustrated in Figure 11 further may comprise stabilization means, such as sliding stabilization  
25 pin 52 shown in Figure 5, to stabilize the flying toy's sail structure in a substantially vertical orientation. These sliding weights of liquid or solid material are moved by gravity. Thus, when the flying toy is rotated 180 degrees, the sliding weights move to the "new" bottom of the flying toy, thereby reversing the  
30 center of gravity to the bottom portion of the flying toy. The sliding stabilization weights may be internally or externally

mounted on the flying toy.

Figure 12 illustrates another embodiment of the present invention wherein the flying toy is frameless and uses only a single guideline. This frameless flying toy embodiment operates essentially in the same manner as the above frame embodiment. In other words, the support structure 130 engages handle sections 114 and is flipped. Rotation of the handles 180 degrees results in an equivalent rotation of the support structure and sail structure allowing travel in an opposite direction. In this embodiment, only a single stabilizing weight is necessary for stabilization.

Flight reversal, in the preferred embodiment, is performed by 180 degree reversal of the handles during play. In alternative embodiments, the sail structure can be pivotally mounted (not shown) within the support structure allowing the pitch of the sail to change by operator adjustment. Further, the pitch can be changed automatically by utilizing the kinetic energy upon impact at the end of travel to shift the position of the sail. Also, the guidelines can be attached to a composite handle (not shown) which mechanically provides rotation independent of the handle grip portion or the lines can be given a partial twist which when encountered by the flying toy causes the present invention to flip approximately 180 degrees, thereby reversing the pitch of the sail and changing the direction of flight without the operator having to rotate the handle.

While the above description contains many specificities they should not be construed as limitations on the scope of the invention, but merely as exemplifications of preferred embodiments thereof. Those skilled in the art will envision many other possible variations are within scope. For example, the dimensions and shapes of the various embodiments may be altered, or alternative materials used to construct the frame, sail,

connectors, sail support structure and unitary structure. The guideline may be provided in a vertical, horizontal orientation, or incremental orientations other than true horizontal or true vertical, and various materials may used for the guidelines and  
5 or guide tubes. These and other variations may be made and still be within the scope of the invention. Accordingly, the scope of the invention should be determined by the appended claims and their legal equivalents, and not limited by the examples which have been given.

What is claimed is:

- 1     1.   A wind driven toy comprising  
2           a pair of substantially parallel guidelines;  
3           a composite wind driven structure slidably secured to said  
4     pair of substantially parallel guidelines and movable by wind  
5     power thereon; and  
6           means for reversing the direction of travel along said  
7     guidelines.
  
- 1     2.   A wind driven flying toy comprising:  
2           one or more guidelines each having a first end and a second  
3     end;  
4           a first handle and a second handle secured respectively to  
5     each of said first and second ends of said one or more  
6     guidelines; and  
7           a wind driven structure comprising at least a sail structure  
8     and a support structure retained by said one or more guidelines  
9     and operable between said first and second ends of said one or  
10    more guidelines,  
11          wherein said wind driven structure reverses direction  
12    between said first and second handles upon altering of pitch of  
13    said sail.
  
- 1     3.   A wind driven flying toy in accordance with claim 2, wherein  
2     said one or more guidelines comprises a pair of substantially  
3     parallel guidelines,  
4           wherein the pitch of said sail is altered upon rotation of  
5     said handles.

1 4. A wind driven flying toy in accordance with claim 3, wherein  
2 said handles are rotated 180 degrees.

1 5. A wind driven flying toy in accordance with claim 3, wherein  
2 said wind driven structure is secured to said pair of  
3 substantially parallel guidelines by a plurality of elongated  
4 tubular elements.

1 6. A wind driven flying toy in accordance with claim 2, wherein  
2 said one or more guidelines comprises a single guideline, and  
3 wherein said sail pitch is altered by a physical interaction of  
4 said wind-driven structure with either of said first handle or  
5 said second handle.

1 7. A wind driven flying toy in accordance with claim 2, wherein  
2 said one or more guidelines comprises a single guideline, and  
3 wherein said sail pitch is altered by a physical interaction of  
4 said wind-driven structure with a user of said flying toy.

1 8. A wind driven flying toy in accordance with claim 2, wherein  
2 said wind driven structure is a composite structure of said sail  
3 structure and said support structure.

1 9. A wind driven flying toy in accordance with claim 8, wherein  
2 said composite structure is manufactured from one or more sheet  
3 materials.

1 10. A wind driven flying toy in accordance with claim 8, wherein  
2 said support structure spans said pair of substantially parallel  
3 guidelines and said sail structure is secured thereto at an angle  
4 to said support structure.

1 11. A wind driven flying toy in accordance with claim 8, wherein  
2 said composite wind structure utilizes only a single guideline.

1 12. A wind driven flying toy in accordance with claim 8, wherein  
2 said support structure has an opening therein and said sail  
3 structure is secured to said support structure by insertion  
4 through said opening in said support structure.

1 13. A wind driven flying toy in accordance with claim 8, wherein  
2 said sail structure is secured to a multi-piece support structure  
3 that attaches to or through said sail structure.

1 14. A wind driven flying toy in accordance with claim 2, wherein  
2 at least one of said support structure and said sail structure  
3 is a resilient air filled structure.

1 15. A wind driven flying toy in accordance with claim 2, wherein  
2 said sail structure and said support structure are in the form  
3 of a single piece wind structure.

1 16. A wind driven flying toy in accordance with claim 15,  
2 wherein said single piece wind structure utilizes only a single  
3 guideline.

1 17. A wind driven flying toy in accordance with claim 2, wherein  
2 each of said first handle and second handle are composite handles  
3 comprising deflector means, energy absorbing means, and means for  
4 holding said composite handle comfortably in a user's hand.

1 18. A wind driven flying toy in accordance with claim 2, wherein  
2 each of said first handle and said second handle substantially  
3 comprise a high density foam that provides for a comfortable  
4 grip, energy absorption on impact of flying toy and protection  
5 for an operator's fingers.

1 19. A wind driven flying toy in accordance with claim 2, wherein  
2 said first handle and said second handle are manufactured from  
3 a material that can hold air or gas under pressure.

1 20. A wind driven flying toy in accordance with claim 2, wherein  
2 each of said first handle and said second handle is a composite  
3 handle, each comprising a rigid handle means, a pair of extension  
4 arms and an elastic structure spanning the pair of extension  
5 arms.

1 21. A wind driven flying toy in accordance with claim 2, wherein  
2 said one or more guidelines are secured to said first handle and  
3 said second handle by connection means selected from the group  
4 comprising knots, clamps, loops, winding, compression, taper  
5 pins, posts, eyelets, holes, hooks, snaps, glue and heat.

1 22. A wind driven flying toy in accordance with claim 2, wherein  
2 each of said first handle and said second handle include a line  
3 length adjustment device.

1 23. A wind driven flying toy comprising:  
2 a guideline having a first end and a second end;  
3 a first handle and a second handle secured respectively to  
4 said first end and said second end; and  
5 a wind driven structure comprising at least a sail structure  
6 retained by said guideline and operable between said first end  
7 and said second end,  
8 wherein said wind driven structure reverses direction  
9 between said first handle and said second handle upon altering  
10 of pitch of said sail.

1 24. A wind driven flying toy in accordance with claim 23,  
2 wherein said wind driven structure further comprises a frame.

1 25. A wind driven flying toy in accordance with claim 23,  
2 wherein said wind driven structure further comprises a support  
3 structure, and wherein said sail structure is frameless.

1 26. A wind driven flying toy in accordance with claim 23,  
2 wherein said wind driven structure comprises a single-piece sail.

1 27. A wind driven flying toy in accordance with claim 24,  
2 wherein said sail structure has an opening therein, said wind  
3 driven structure further comprises a guidetube, said guidetube  
4 encapsulating said guideline, passing through opening in said  
5 sail structure and retaining said sail in a fixed angle with  
6 respect to said guidetube.

1 28. A wind driven flying toy in accordance with claim 25,  
2 wherein said support structure has an opening therein and said  
3 sail structure is secured to said support structure by insertion  
4 through said opening in said support structure.



1 29. A wind driven flying toy in accordance with claim 26,  
2 wherein said single-piece sail is manufactured from a foam,  
3 plastic or wood product.

1 30. A wind driven flying toy in accordance with claim 23,  
2 wherein said sail pitch is altered by a physical interaction with  
3 either of said first or second handles.

1 31. A wind driven flying toy in accordance with claim 23,  
2 wherein said sail pitch is altered by a physical interaction with  
3 a user of said flying toy.

1 32. A wind driven flying toy in accordance with claim 23,  
2 wherein said first handle and said second handle are manufactured  
3 from a material that can hold air or gas under pressure.

1 33. A wind driven flying toy in accordance with claim 23,  
2 wherein said guideline is secured to said first handle and said  
3 second handle by connection means selected from the group  
4 comprising knots, clamps, loops, winding, compression, taper  
5 pins, posts, eyelets, holes, hooks, snaps, glue and heat.

1 34. A wind driven flying toy in accordance with claim 23,  
2 wherein said first and second handle includes a line length  
3 adjustment device.

1 35. A wind driven flying toy in accordance with claim 9, wherein  
2 said one or more sheet materials are derived from a pre-  
3 manufactured carton and wherein at least one of said sail  
4 structure and said support structure are cutout from said carton.

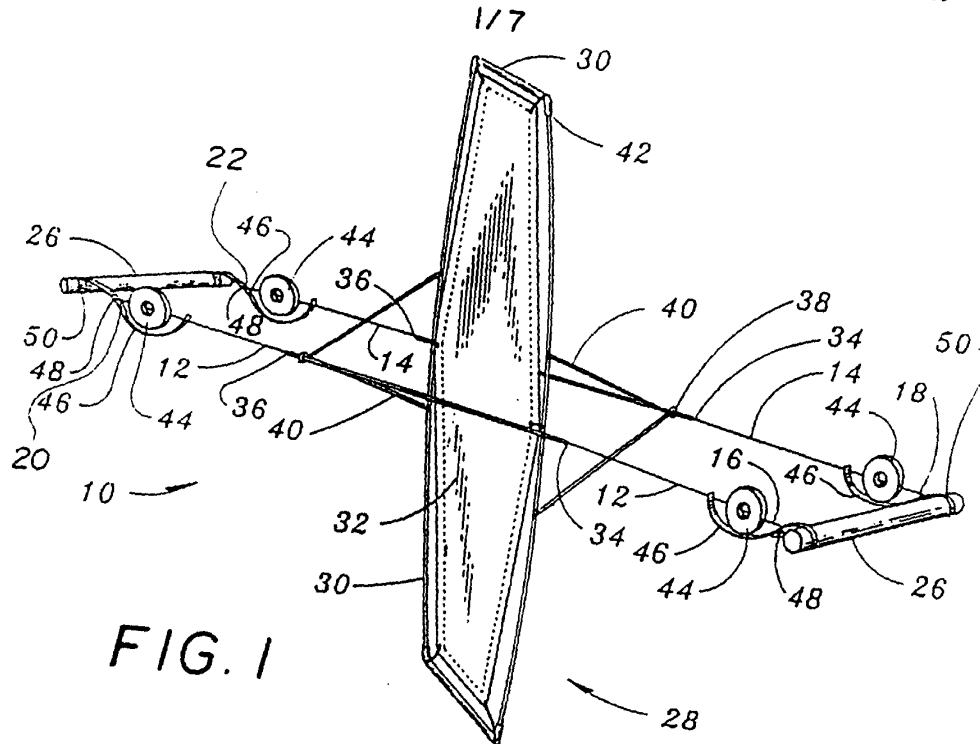


FIG. 1

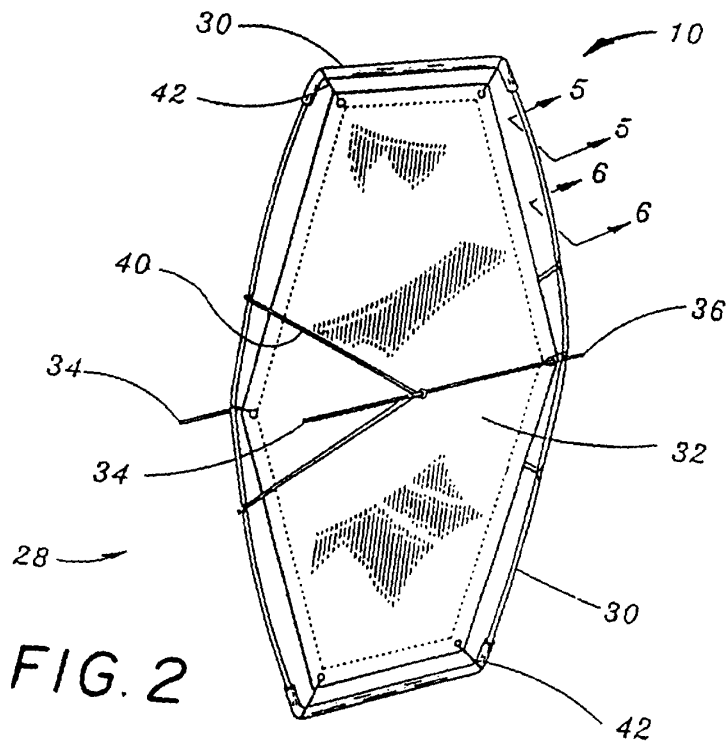
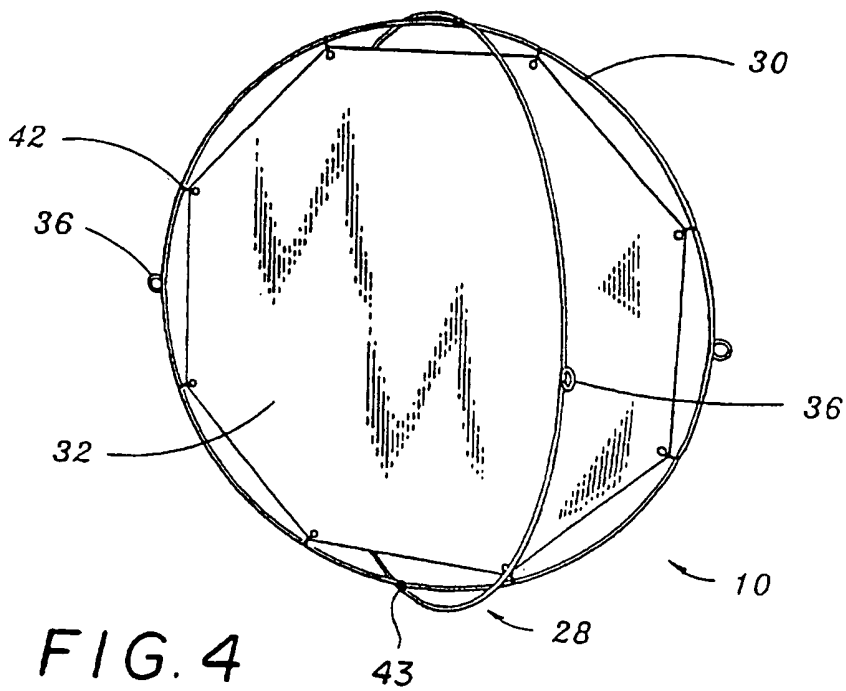
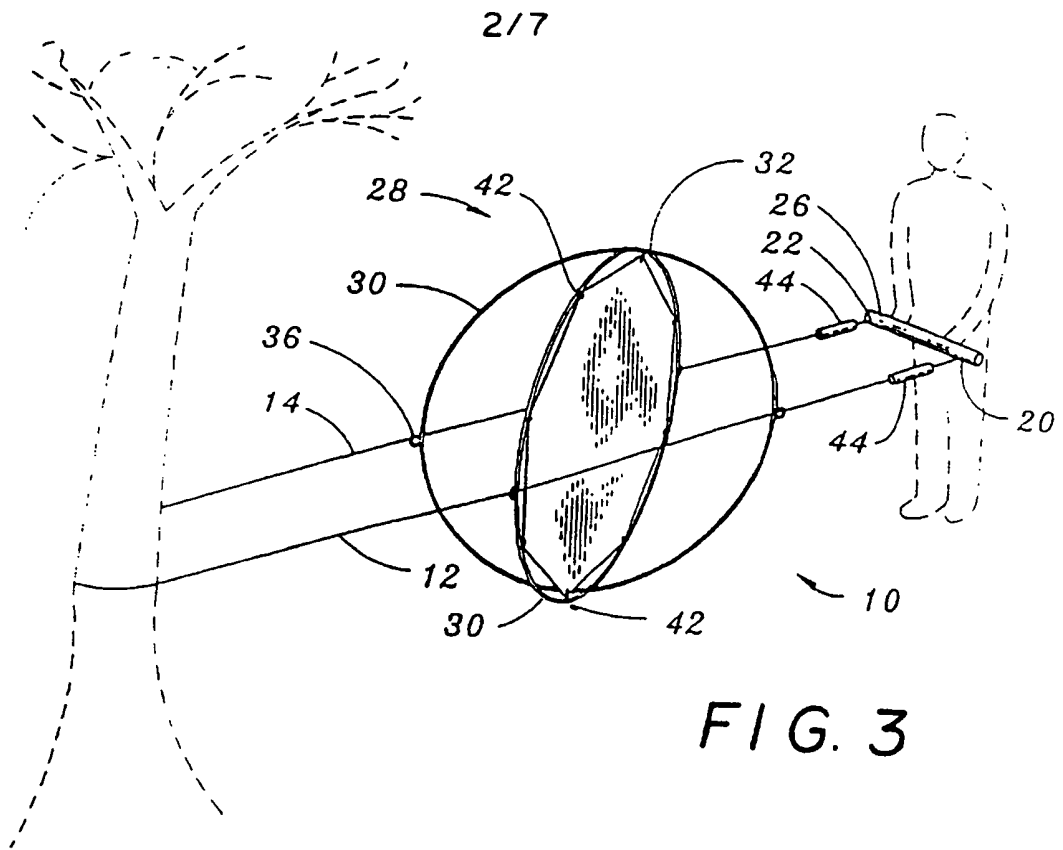


FIG. 2



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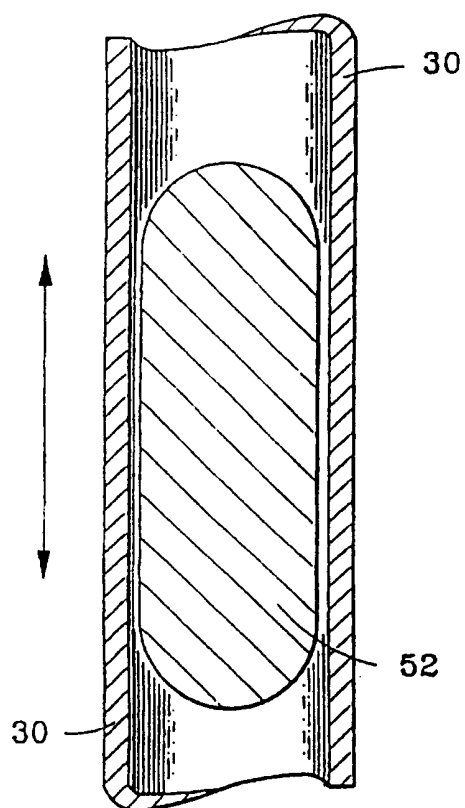


FIG. 5

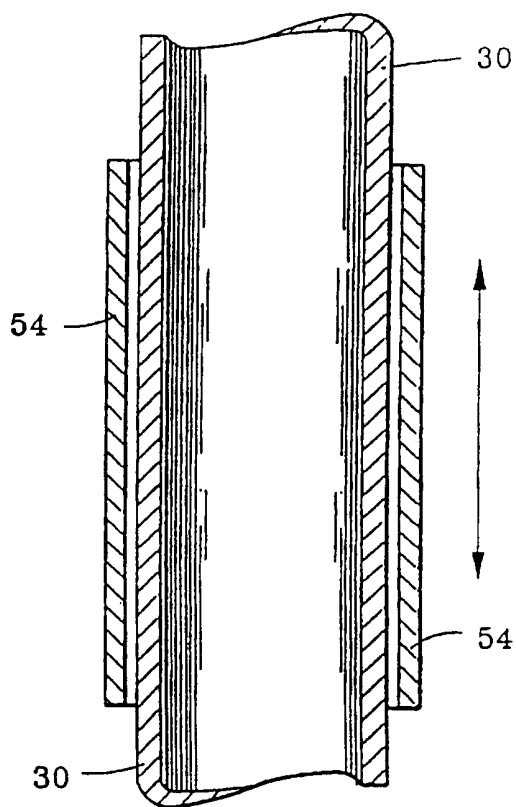


FIG. 6

FIG. 7

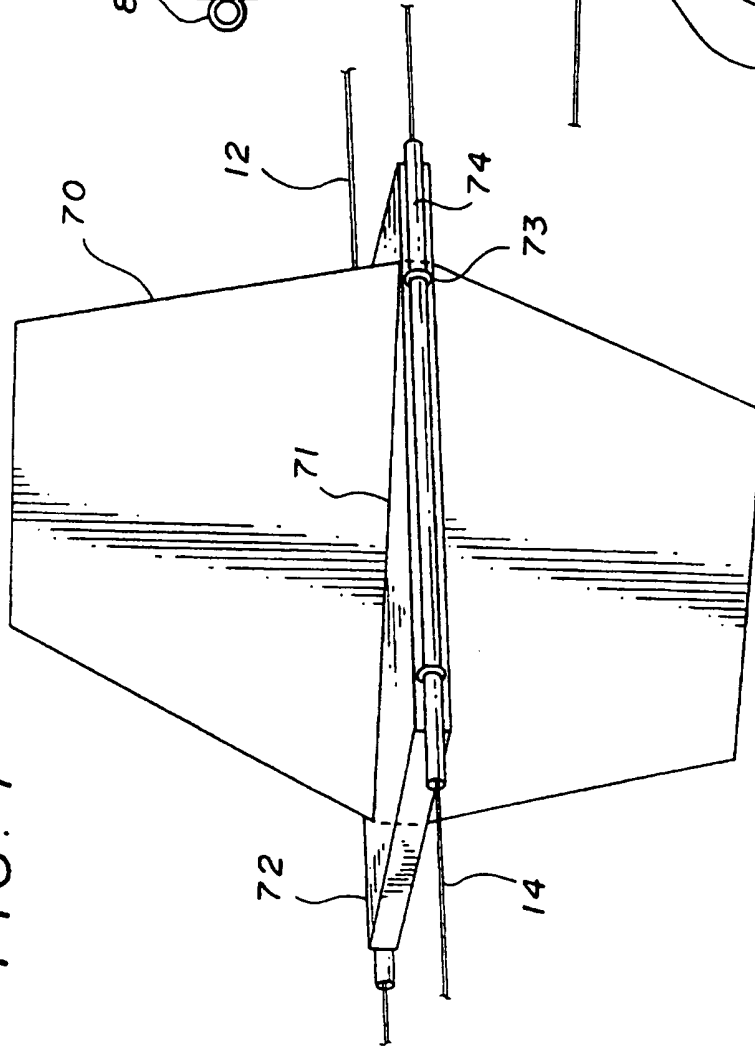


FIG. 8

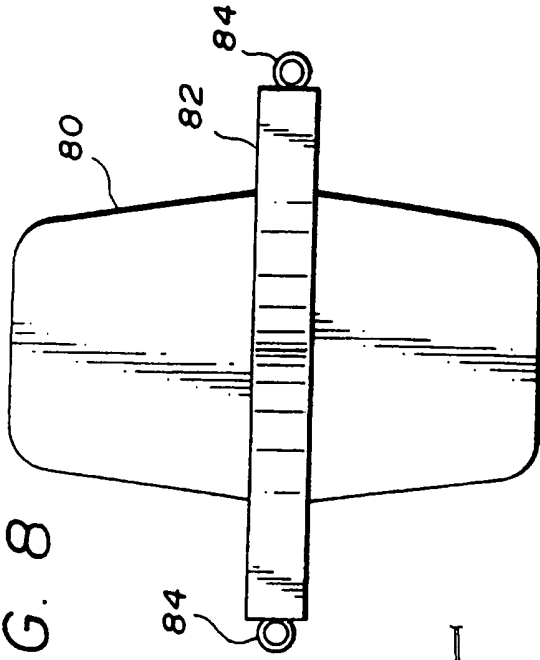
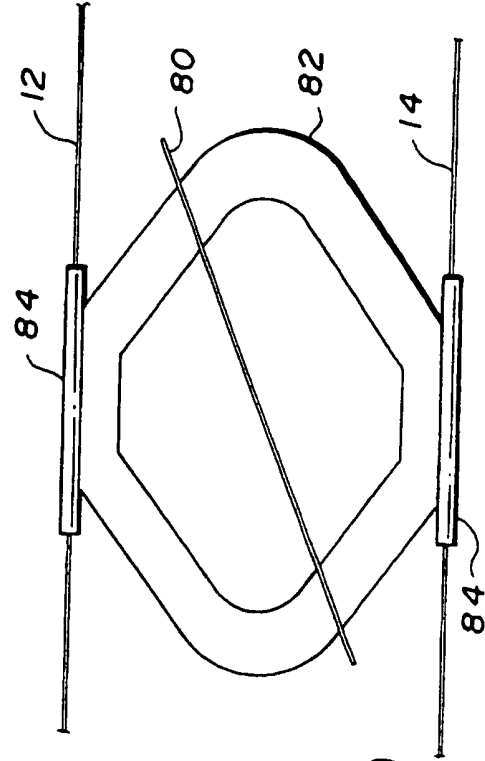


FIG. 9



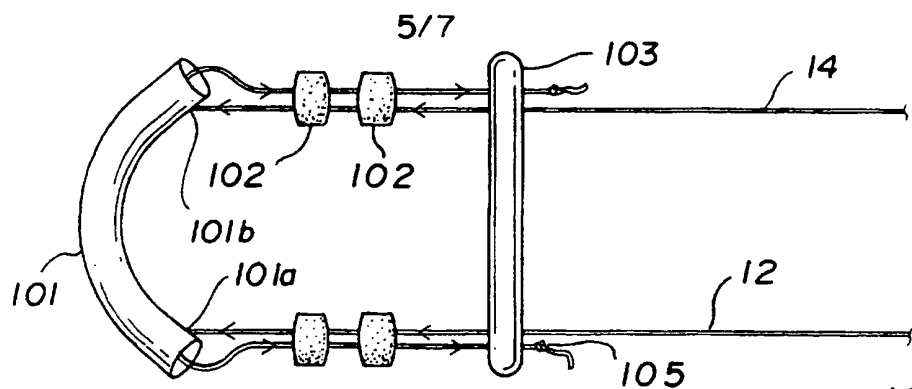


FIG. 10a

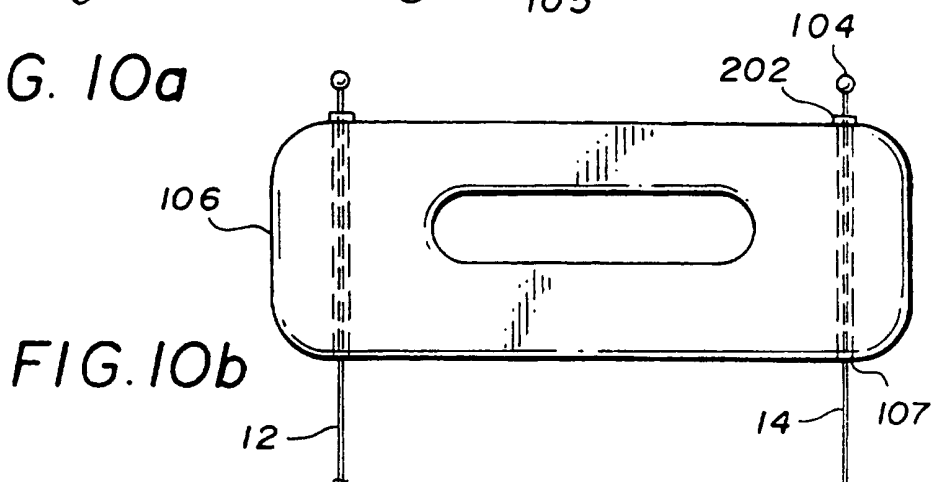


FIG. 10b

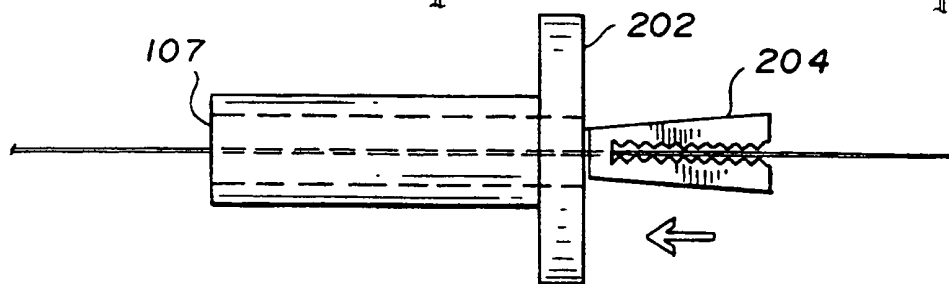


FIG. 10c

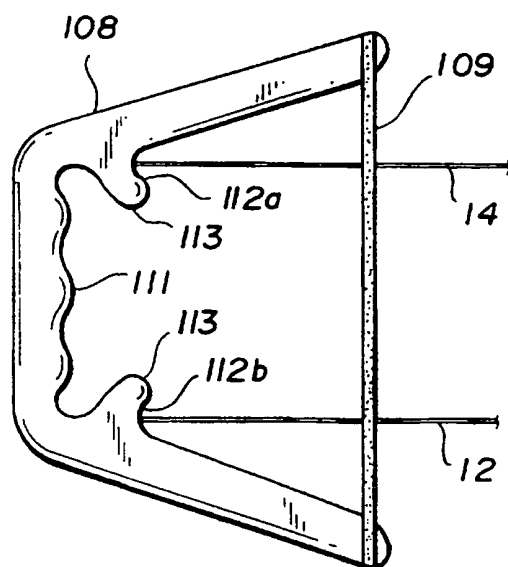


FIG. 10d

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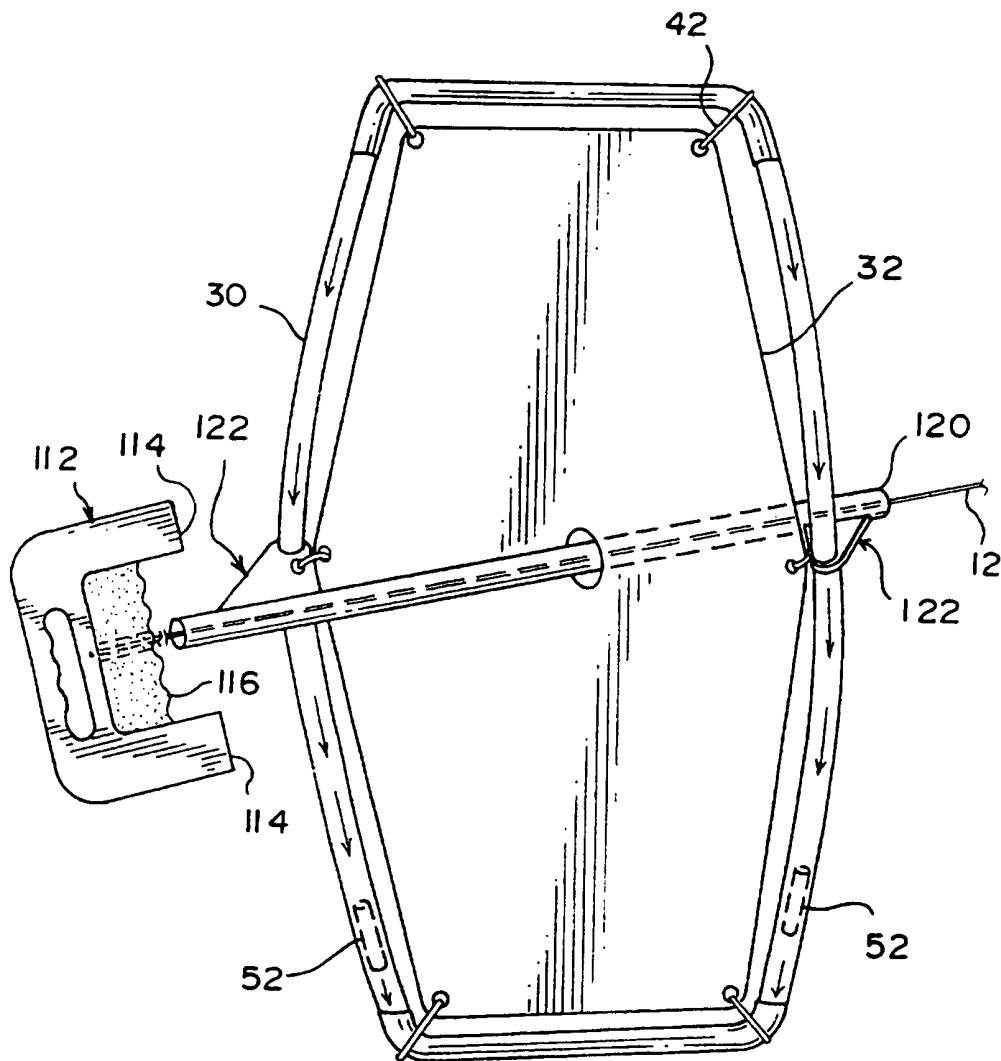


FIG. II

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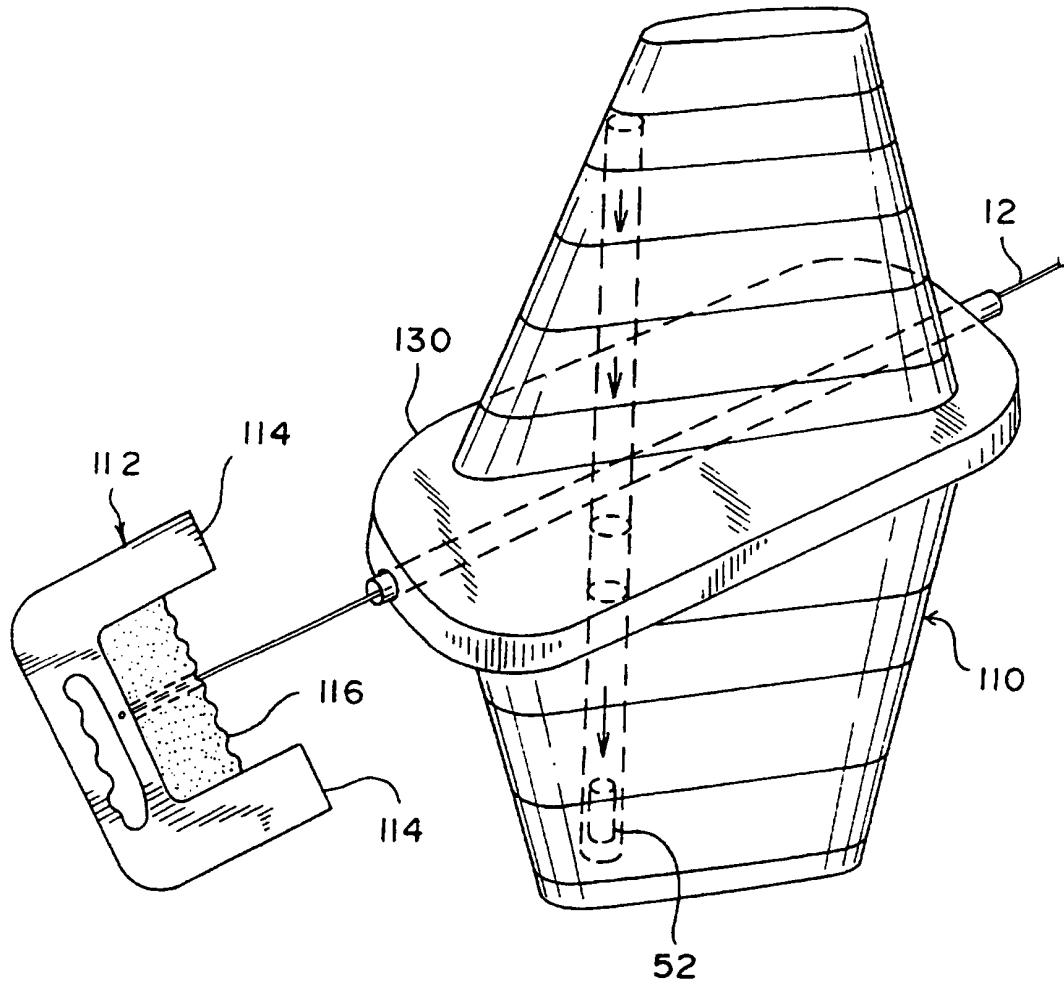


FIG. 12

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## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US97/04465

## A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) : A63H 33/40

US CL : 446/176, 489, 490

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 244/153R, 155R; 273/351; 446/30-33, 176, 228-232, 489-491; 473/516, 575

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X --- Y	US 3,006,586 A (STRELAKOS, JR.) 31 October 1961, entire document.	2, 7-9, 11, 15, 16, 23-27, 29, 31 ----- 35
X	US 3,839,817 A (WIDENER) 08 October 1974, Figs. 1, 2 and 12.	17, 20-22, 33, 34
A	US 3,893,256 A (WOLF et al) 08 July 1975, entire document.	1-35

☒ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:	
*A* document defining the general state of the art which is not considered to be of particular relevance	*T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
*E* earlier document published on or after the international filing date	*X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
*L* document which may throw doubt on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	*Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
*O* document referring to an oral disclosure, use, exhibition or other means	
*P* - document published prior to the international filing date but later than the priority date claimed	*A* document member of the same patent family

Date of the actual completion of the international search

01 MAY 1997

Date of mailing of the international search report

02 JUN 1997

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## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US97/04465

## C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X --- Y	US 2,634,127 A (SHAPIRO) 07 April 1953, Figs. 1 and 2.	1-4, 8, 9, 15, 21, 23-25, 27, 29, 30, 33 ----- 22, 34, 35